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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/508,891	09/23/2004	Ryuichi Katayama	P/2108-35	9833

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EXAMINER	
GUPTA, PARUL H	

ART UNIT	PAPER NUMBER
2627	

DATE MAILED: 05/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/508,891	KATAYAMA, RYUICHI	
	Examiner	Art Unit	
	Parul Gupta	2627	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 April 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTIONt

1. An amendment filed on 4/14/06 has been considered with the following results.

Response to Arguments

2. Applicant's arguments filed on 4/14/06 with respect to claims 1 and 7 have been fully considered but they are not persuasive. The problem being solved by the invention of Shimano in view of Takasuka et al. shows a similar diffractive optical element with the same phase difference.The limitation given in the arguments refers to the specification and not the claims. An additional reference of Ophey, US Patent 6,407,973, discloses the different directions of gratings given in the disclosure of the applicant.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-8, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimano, US Patent 6,400,664 in view of Takasuka et al., US Patent 6,501,601.

Regarding claim 1, Shimano teaches an optical head device (figure 1 or figure 7) comprising: a light source (element 101, explained in column 6, lines 29-52); a diffractive optical element (102, 701) for diffracting light emitted from said light source to split the light into a main beam (108) and sub-beams (elements 109 and 110, explained

in column 7, lines 1-17); an objective lens (106) for focusing said main beam and said sub-beams onto an optical recording medium (element 106 of figure 1 and element 2008 of figure 20); an astigmatism generation unit (element 111 or "dichromatic mirror" of element 2005 in figure 20) for providing astigmatism to light reflected from said optical recording medium (column 21, lines 23-30); and a photodetector (115) for receiving light transmitted through said astigmatism generation unit to receive the main beam and the sub-beams (shown in figure 21 and explained in column 21, lines 30-34), and the main beam and the sub-beams are focused in a region containing the same track on said optical recording medium (Elements 108, 109, and 110 are focused in a region on the same track as shown. Further explanation is given in column 7, lines 32-37).

Shimano does not teach said diffractive optical element is divided into first, second, third, and fourth regions by a first straight line that crosses an optical axis of the light and extends in an extending direction of a grating of said diffractive optical element and a second straight line that crosses the optical axis and is perpendicular to said first line (although something similar is given in column 11, lines 57-65). Shimano also does not teach a phase of the grating in said first region and said second region located diagonally with respect to said first region is different from a phase of the grating in said third region and said fourth region that are adjacent to said first and second regions and are located diagonally by substantially π (The closest things given in Shimano are that the phase difference of π is shown in figure 10 while the explanation for the

configuration of detectors is shown in figure 8. The explanations for both are given in column 8, lines 5-20 and column 17, lines 14-20.).

Takasuka et al. teaches in element 8 of figure 3B a diffractive optical element that is divided into first, second, third, and fourth regions by a first straight line that crosses an optical axis of the light and extends in an extending direction of a grating of said diffractive optical element and a second straight line that crosses the optical axis and is perpendicular to said first line and phase of the grating in said first region and said second region located diagonally with respect to said first region is different from a phase of the grating in said third region and said fourth region that are adjacent to said first and second regions and are located diagonally (column 6, lines 41-51).

It would have been obvious to one of ordinary skill in the art at the time of the invention to include the diffraction grating as taught by Takasuka et al. into the system of Shimano in order to allow the light amount of both the main beam and the sub-beams to be increased without increasing the light emission of the semiconductor laser element, and to enhance the S/N ratio of the main beam and the sub-beams and to ensure that the offset of the tracking error signal is reduced by suppressing multiple reflections between the information recording medium and the optical components used for the optical device, and the S/N ratio of the reproduction signal or the tracking error signal is increased by suppressing interference between the main beam and sub-beams (column 6, lines 25-38).

Regarding claim 2, Shimano teaches the optical head device according to claim 1, wherein said optical recording medium is circular in shape ("optical disk" mentioned

throughout reference), said first straight line is parallel to a tangential direction of a track in a region of said optical recording medium that is irradiated with light (column 17, lines 1-5), and said second straight line is parallel to a radial direction in the region of said optical recording medium (column 16, lines 63-65).

Regarding claim 3, Shimano teaches the optical head device according to claim 1, wherein said main beam is zero-th order light transmitted through said diffractive optical element, and said sub-beams are minus first order diffracted light and plus first order diffracted light that have been diffracted by said diffractive optical element (column 10, lines 7-15).

Regarding claim 4, Shimano teaches the optical head device according to claim 1, wherein said light source is a semiconductor laser (column 6, lines 29-30).

Regarding claim 5, Shimano uses figure 20 (which is explained from column 19, line 55 to column 20, line 17) to teach the optical head device according to claim 1, comprising a beam splitter (element 2006) for allowing at least a part of light incident thereon from said diffractive optical element to exit toward said objective lens (element 2008) and for allowing at least a part of light incident thereon from said objective lens after being reflected from said optical recording medium to exit toward said astigmatism generation unit (element 2005).

Regarding claim 6, Shimano teaches the optical head device according to claim 5, wherein said beam splitter is a polarization beam splitter (element 2006 of figure 20 and explained in column 7, lines 59-63) that transmits P-polarized light and reflects S-polarized light (basic type of polarization beam splitter common to the art), and the

optical head device further comprises a quarter-wave plate provided between said polarization beam splitter and said objective lens (element 2008 of figure 20). Further description of the structure of the optical head device is given in column 3, lines 51-53.

Regarding claim 7, Shimano teaches an optical information recording or reproducing apparatus comprising: an optical head device comprising: a light source (element 101, explained in column 6, lines 29-52); a diffractive optical element (102, 701) for diffracting light emitted from said light source to split the light into a main beam (108) and sub-beams (elements 109 and 110, explained in column 7, lines 1-17); an objective lens (106) for focusing said main beam and said sub-beams onto an optical recording medium (element 106 of figure 1 and element 2008 of figure 20); an astigmatism generation unit (element 111 or "dichromatic mirror" of element 2005 in figure 20) for providing astigmatism to light reflected from said optical recording medium (column 21, lines 23-30); and a photodetector (115) for receiving light transmitted through said astigmatism generation unit to receive the main beam and the sub-beams (shown in figure 21 and explained in column 21, lines 30-34), and the main beam and the sub-beams are focused in a region containing the same track on said optical recording medium (Elements 108, 109, and 110 are focused in a region on the same track as shown. Further explanation is given in column 7, lines 32-37); an error signal generation circuit ("electrical circuit" of column 8, line 11) for generating focusing error signals of said main beam and said sub-beams by an astigmatism method based on a detection signal of said photodetector (column 7, lines 64-67) and outputting a sum of

the focusing error signals of said main beam and said sub-beams as a focusing error signal for a focusing-servo operation (column 8, lines 20-26); and an objective lens driving unit for controlling a position of said objective lens based on said focusing error signal for the focusing-servo operation (given in figures 17-19 and explained in column 17, lines 44-55). Although not explicitly stated, it is inherent that a driving unit must exist for the objective lens to be moved based on the combination of the tracking error signal and focusing error signal as specified.

Shimano does not teach said diffractive optical element is divided into first, second, third, and fourth regions by a first straight line that crosses an optical axis of the light and extends in an extending direction of a grating of said diffractive optical element and a second straight line that crosses the optical axis and is perpendicular to said first line (although something similar is given in column 11, lines 57-65). Shimano also does not teach a phase of the grating in said first region and said second region located diagonally with respect to said first region is different from a phase of the grating in said third region and said fourth region that are adjacent to said first and second regions and are located diagonally by substantially π (The closest things given in Shimano are that the phase difference of π is shown in figure 10 while the explanation for the configuration of detectors is shown in figure 8. The explanations for both are given in column 8, lines 5-20 and column 17, lines 14-20.).

Takasuka et al. teaches in element 8 of figure 3B a diffractive optical element that is divided into first, second, third, and fourth regions by a first straight line that crosses an optical axis of the light and extends in an extending direction of a grating of

said diffractive optical element and a second straight line that crosses the optical axis and is perpendicular to said first line and phase of the grating in said first region and said second region located diagonally with respect to said first region is different from a phase of the grating in said third region and said fourth region that are adjacent to said first and second regions and are located diagonally (column 6, lines 41-51).

It would have been obvious to one of ordinary skill in the art at the time of the invention to include the diffraction grating as taught by Takasuka et al. into the system of Shimano in order to allow the light amount of both the main beam and the sub-beams to be increased without increasing the light emission of the semiconductor laser element, and to enhance the S/N ratio of the main beam and the sub-beams and to ensure that the offset of the tracking error signal is reduced by suppressing multiple reflections between the information recording medium and the optical components used for the optical device, and the S/N ratio of the reproduction signal or the tracking error signal is increased by suppressing interference between the main beam and sub-beams (column 6, lines 25-38).

Regarding claim 8, Shimano teaches the optical information recording or reproducing apparatus according to claim 7, wherein said error signal generation circuit ("electrical circuit" of column 8, line 11) generates tracking error signals of said main beam and said sub-beams by a push-pull method based on the detection signal of said photodetector (column 7, lines 64-67) and further outputs a difference between the tracking error signal of the main beam and the tracking error signal of the sub-beams as

a tracking error signal for a tracking-servo operation (column 8, lines 26-31), and said objective lens driving unit further controls the position of said objective lens based on said tracking error signal for the tracking-servo operation (column 6, lines 1-6). Although not explicitly stated, it is inherent that a driving unit must exist for the objective lens to be moved based on the tracking error signal as specified.

Regarding claim 12, Shimano teaches the optical head device according to claim 2, wherein said main beam is zero-th order light transmitted through said diffractive optical element, and said sub-beams are minus first order diffracted light and plus first order diffracted light that have been diffracted by said diffractive optical element (column 10, lines 7-15).

4. Claims 9-11 and 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimano in view of Takasuka et al. as applied to claims 7and 8 above, and further in view of Ando, US Patent 6,088,315.

Regarding claims 9 and 13, Shimano teaches the limitations of claims 7 and 8.

Shimano does not teach any of the limitations of claims 9-11 or 13-15.

Regarding claim 9, Ando teaches the optical information recording or reproducing apparatus, further comprising light source driving unit ("laser controller" of element 11 in figure 2) for controlling an output of said light source (explained in column 9, lines 56-59).

Regarding claim 10, Ando teaches the optical information recording or reproducing apparatus according to claim 9, wherein said light source driving unit drives said light source based on recording data externally input thereto (column 9, lines 50-67

explains how the output of the monitoring detector is turned into a reproduction signal, which drives the laser controller).

Regarding claim 11, Ando teaches the optical information recording or reproducing apparatus according to claim 9, wherein said light source driving unit drives said light source with a constant output (column 9, lines 56-59).

Regarding claim 13, Ando teaches the optical information recording or reproducing apparatus, further comprising light source driving unit ("laser controller" of element 11 in figure 2) for controlling an output of said light source (explained in column 9, lines 56-59).

Regarding claim 14, Ando teaches the optical information recording or reproducing apparatus according to claim 13, wherein said light source driving unit drives said light source based on recording data externally input thereto (column 9, lines 50-67 explains how the output of the monitoring detector is turned into a reproduction signal, which drives the laser controller).

Regarding claim 15, Ando teaches the optical information recording or reproducing apparatus according to claim 13, wherein said light source driving unit drives said light source with a constant output (column 9, lines 56-59).

It would have been obvious to one of ordinary skill in the art at the time of the invention to include the driving unit to control the light source as taught by Ando into the system of Shimano. This would be necessary in order to raise the output level of the laser beam which is emitted from the laser diode in order to heat the recording layer of the optical disc to the Curie temperature or higher in the recording mode and to reduce

the output level of the laser beam to a level lower than the output level upon recording to provide optimal recording (column 14, lines 51-57 of Ando).

Conclusion

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Parul Gupta whose telephone number is 571-272-5260. The examiner can normally be reached on Monday through Thursday, from 8:30 AM to 7 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hoa Thi Nguyen can be reached on 571-272-7579. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

PHG
5/15/06

THANG V. TRAN
PRIMARY EXAMINER